

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

STUDIENGESELLSCHAFT KOHLE MBH  
Kaiser-Wilhelm-Platz 1  
45470 Mülheim an der Ruhr  
ALLEMAGNE

**Eingegangen**

29. Jan. 2007

Erlaubt

Date of mailing (day/month/year) 18 January 2007 (18.01.2007)	
Applicant's or agent's file reference A402	IMPORTANT NOTIFICATION
International application No. PCT/DE2005/000399	International filing date (day/month/year) 09 March 2005 (09.03.2005)
Applicant STUDIENGESELLSCHAFT KOHLE MBH et al	

**1. Transmittal of the translation to the applicant.**

The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

**2. Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

**3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Agnes Wittmann-Regis

Facsimile No. +41 22 338 82 70

Facsimile No. +41 22 338 82 70

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference A402	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. PCT/DE2005/000399	International filing date ( <i>day/month/year</i> ) 09 March 2005 (09.03.2005)	Priority date ( <i>day/month/year</i> ) 31 March 2004 (31.03.2004)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant STUDIENGESELLSCHAFT KOHLE MBH		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 14 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 09 January 2007 (09.01.2007)
Facsimile No. +41 22 338 82 70	Authorized officer <div style="text-align: center; font-weight: bold; margin-top: 10px;">Agnes Wittmann-Regis</div> e-mail: pt06@wipo.int

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **See form PCT/ISA/210**

Applicant's or agent's file reference

**A402**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/DE2005/000399**

International filing date (day/month/year)

**09.03.2005**

Priority date (day/month/year)

**31.03.2004**

International Patent Classification (IPC) or both national classification and IPC

**C25B11/04, C23C18/12, C01G55/00**

Applicant

**STUDIENGESELLSCHAFT KOHLE MBH**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. I

Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>2-5</u>	YES
	Claims <u>1, 6-9</u>	NO
Inventive step (IS)	Claims _____	YES
	Claims <u>1-9</u>	NO
Industrial applicability (IA)	Claims <u>1-9</u>	YES
	Claims _____	NO

2. Citations and explanations:

1.1 Reference is made to the following documents:

- D1: DATABASE WPI Section Ch, Week 198750 Derwent  
Publications Ltd., London, GB; Class D15, AN  
1987-351947 XP002362777 & JP 62 254817 A  
(FUJI ELECTRIC MFG CO LTD) 6 November 1987  
(1987-11-06)
- ✓ D2: DE 102 11 701 A1 (STUDIENGESELLSCHAFT KOHLE  
MBH) 25 September 2003 (2003-09-25)
- ✓ D3: US-A-3 711 385 (BEER H, BE) 16 January 1973  
(1973-01-16)
- ✓ D4: US-A-5 658 355 (COTTEVIEILLE ET AL) 19 August  
1997 (1997-08-19)
- ✓ D5: US-A-5 550 706 (KURZWEIL ET AL) 27 August  
1996 (1996-08-27)
- ✓ D6: WO 98/02891 A (THE UNITED STATES OF AMERICA)  
22 January 1998 (1998-01-22)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

**1 NOVELTY**

1.1 The present application does not meet the requirements of PCT Article 33(1) because the subject matter of claims 1, and 6-9 is not novel within the meaning of PCT Article 33(2)).

1.2 Document D1 discloses (the references between parentheses apply to said document) a method for producing a Ti electrode, comprising the following steps: a) applying colloidal iridium oxide to a Ti surface, b) drying the coated surface and c) burning the surface (cf. Derwent, abstract).

The subject matter of claims 1, 6 and 7 therefore lacks novelty.

1.3 Document D2 (the references between parentheses apply to said document) discloses a method for in situ immobilisation of water-soluble nano-dispersed preformed metal oxide colloids on an oxidic or non-oxidic substrate (e.g.  $\text{TiO}_2$ ,  $\text{SnO}_2$ ). The particle size of the nanostructured metal oxide colloids lies between 0.5 nm and 5 nm, preferably between 1 and 3 nm. Colloidal metal oxide is produced by hydrolysis, stirring an aqueous solution of the metal salt (e.g. Ir salt) and a base (e.g. KOH). The temperature used for the reaction is between 50 and 90°C. The colloidal particles are immobilised on the substrate from the reaction solution (cf. page 2, paragraphs 1-2,

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

lines 1-15, page 3, paragraph 17, page 4,  
paragraphs 21, 23-29, page 7, example 6, table 3,  
lines 10-15).

The subject matter of claims 8 and 9 therefore  
lacks novelty.

**3 INVENTIVE STEP**

- 3.1 The present application does not meet the  
requirements of PCT Article 33(1) because the  
subject matter of claims 1-9 does not involve an  
inventive step within the meaning of PCT Article  
33(3).

**DEPENDENT CLAIMS 2-7**

- 3.2 Dependent claims 2-6 do not contain any features  
that, in combination with the features of any  
claim to which they refer, meet the PCT  
requirements for inventive step. With regard to  
the features of claims 2-6, document D2 describes  
the same advantages as the present application.  
The person skilled in the art would therefore  
consider the inclusion of these features in the  
method described in D1 to be a routine measure for  
solving the problem of interest (see items 1.2 and  
1.3 in the present report).
- 3.3 The subject matter of claims 6 and 7 is not novel  
and therefore does not involve an inventive step  
either (PCT Article 33(3)).

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

**INDEPENDENT CLAIM 1**

- 3.4 Document D3 is considered the closest prior art over the subject matter of claim 1. It discloses (references in brackets relate to said document): A method for producing coatings consisting of 95% platinum oxide and 5% silicon oxide, said method comprising the following steps: a) applying colloidal platinum oxide to a Ti surface (e.g. by immersion), b) drying the coated surface and c) burning the surface at a temperature of 800-1100°C (cf. example 12, lines 20-41). D3 also discloses a method for producing coatings consisting of 50% iridium oxide and 50% rhodium oxide, said method comprising the following steps: a) applying colloidal 50% IrO<sub>2</sub> and 50% RhO<sub>2</sub> to an Nb surface (e.g. by immersion), b) drying the coated surface and c) reaction pressing (cf. example 11, lines 60-70).
- 3.5 The subject matter of claim 1 in the present application therefore differs from the known features in document D3 in that the coating is of platinum oxide instead of iridium oxide (cf. D3, example 12).
- 3.6 However, it is generally known to the person skilled in the art that the "iridium oxide" feature is equivalent to the "platinum oxide" feature known from document D3 and can be replaced by the latter if required, because iridium (or



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

"platinum metal" as it is called) is a metal in the platinum group.

- 3.7 Furthermore, since no references can be found in the application specifying the problem that is solved by the "iridium oxide" feature of the present application, compared to the prior art disclosed in D3, the subject matter of claim 1 does not involve an inventive step.

Therefore, the subject matter of claim 1 does not involve an inventive step over document D3 (PCT Article 33(3)).

**INDEPENDENT CLAIM 8**

- 3.8 The subject matter of claim 8 is not novel and for that reason does not involve an inventive step (PCT Article 33(3)).

**INDEPENDENT CLAIM 9**

- 3.9 Document D3 is also considered the closest prior art to the subject matter of claim 9. It discloses (the references between parentheses apply to said document) a method for producing a colloidal metal oxide mixture consisting of 50% IrO<sub>2</sub> and 50% RhO<sub>2</sub>, by reaction of the aqueous solution of the salt of the metals (the Ir salt and the Rh salt) and the caustic soda solution (NaOH solution) (cf. example 11, lines 50-60).

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
3.10	<p>The subject matter of claim 91 in the present application therefore differs from the known features in document D3 in that a metal oxide mixture (50% IrO<sub>2</sub> and 50% RhO<sub>2</sub>) is produced instead of 100% IrO<sub>2</sub>.</p> <p>3.11 However, it is generally known to the person skilled in the art that the "iridium oxide" feature and the "rhodium oxide" feature are equivalent and interchangeable, because iridium and rhodium (or "platinum metals" as they are collectively called) are metals in the platinum group.</p> <p>3.12 Furthermore, since no references can be found in the application specifying the problem that is solved by the "iridium oxide" feature of the present application, compared to the prior art disclosed in D3, the subject matter of claim 9 does not involve an inventive step.</p> <p>3.13 Document D4 (the references between parentheses apply to said document) discloses a method for producing ruthenium oxide or metal oxide mixtures of ruthenium oxide and iridium oxide by reaction of the aqueous solution of the salt of the metals (H<sub>2</sub>IrCl<sub>6</sub> and RuCl<sub>3</sub> · xH<sub>2</sub>O) and a concentrated alkaline solution (cf. example 2). D4 also discloses a method for producing coatings consisting of metal oxide mixtures of ruthenium oxide and iridium oxide, said method comprising the following steps:</p> <p>a) applying colloidal metal oxides to a Ti</p>

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

surface, b) drying the coated surface and c) burning the surface in the hardening oven (cf. example 4). Furthermore, D4 discloses pretreatment of the titanium substrate (cf. example 5) and the feature specifying that the surface to be coated is the surface of a titanium electrode (cf. example 4).

It also follows, for the same reasons (see items 3.4, 3.5, 3.8 and 3.9 above), that the subject matter of claims 1-9 does not involve an inventive step over document D4.

3.14 Document D5 (the references between parentheses apply to said document) also discloses a method for producing colloidal ruthenium oxide by reaction between the aqueous solution of the Ru salt ( $\text{RuCl}_3 \cdot x\text{H}_2\text{O}$ ) and the caustic soda solution (1N NaOH solution) (cf. example 2).

3.15 Document D6 also describes a method for producing colloidal metal oxides (e.g. iridium oxide, ruthenium oxide) by reaction, under stirring, between the aqueous solution of the metal salt ( $\text{RuCl}_3 \cdot n\text{H}_2\text{O}$ ) and the caustic soda solution (NaOH solution) (cf. page 5, line 31 - page 6, line 13; page 6, line 19 - page 7, line 9; page 8, line 7 - page 9, line 3; claims 2-5).

Accordingly, the subject matter of claim 9 likewise does not involve an inventive step over document D5 or document D6.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

4 **INDUSTRIAL APPLICABILITY**

- 4.1 Claims 1-9 comply with the requirements of PCT Article 33(4), because the invention can be used to treat metal surfaces.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. VI

Certain documents cited

1. Certain published documents (Rule 43bis.1 and 70.10)

Application No.  
Patent No.

Publication date  
(day/month/year)

Filing date  
(day/month/year)

Priority date (valid claim)  
(day/month/year)

2. Non-written disclosures (Rule 43bis.1 and 70.9)

Kind of non-written disclosure

Date of non-written disclosure  
(day/month/year)

Date of written disclosure  
referring to non-written disclosure  
(day/month/year)

See Form 210

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. VIII      Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- 1      The application does not satisfy the requirements of PCT Article 6, because claims 1 and 3-9 are not clear.
- 2      The expressions "particularly", "preferably" and "particularly preferred" used in claims 3, 4, 5, 6, 7, 8 and 9 are vague and unclear and do not restrict the scope of protection of the claim, that is to say, any feature preceded by such an expression must be considered entirely optional (PCT Article 6, PCT Guidelines Chapter 5, paragraph 5.40).
- 3      The reference "pH > 11, preferably  $\geq 12$ " described on page 3, line 26 or on page 4, lines 14-15 does not fall under the current claims 4 and 9. This contradiction between claims 4, 9 and the description gives rise to doubts concerning the subject matter for which protection is sought, with the result that claims 4 and 9 are not clear (PCT Article 6).
- 4      The signs "d", "e" and "f" used in claim 1 appear to be incorrect (or typing mistakes), and leave the reader uncertain as to the meaning of the technical feature in question. As a result, the

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2005/000399

Box No. VIII      Certain observations on the international application

subject matter of said claim is not clearly defined (PCT Article 6).

5      Claim 1 does not satisfy the requirements of PCT Article 6, because the subject matter for which protection is sought is not clearly defined. Claim 1 attempts to define the subject matter in terms of the result to be achieved, namely that "steps **a** to **c** can be repeated until the desired layer thickness has been obtained", but in doing so merely states the problem to be solved, without proposing the technical features necessary for achieving said result.

6      Furthermore, the expression "desired layer thickness" used in claim 1 is vague and unclear and does not restrict the scope of protection of the claim, that is to say, any feature preceded by such an expression must be considered entirely optional (PCT Article 6, PCT Guidelines Chapter 5, paragraph 5.40).